

Ordered semigroups characterized by (mathematic formula)-fuzzy generalized bi-ideals

Abstract:

In this paper, we introduce a considerable machinery that permits us to characterize a number of special (fuzzy) subsets in ordered semigroups. In this regard, we generalize (Davvaz and Khan in Inform Sci 181:1759–1770 2011) and define $(2;2 \text{ } _qk)$ -fuzzy generalized bi-ideals in ordered semigroups, which is a generalization of the concept of an (a, b) -fuzzy generalized bi-ideal in an ordered semigroup. We also define $(2;2 \text{ } _qk)$ -fuzzy left (resp. right)- ideals. Using these concept, some characterization theorems of regular, left (resp. right) regular, completely regular and weakly regular ordered semigroups are provided. The upper/ lower parts of an $(2;2 \text{ } _qk)$ -fuzzy generalized bi-ideal and $(2;2 \text{ } _qk)$ -fuzzy left (resp. right)-ideal are given, and some characterizations are provided.